

TO THE ENGLISH GENTRIE,

and all others studious of the

MATHEMATICKS, which
shall bee Readers
hereof.

The just Apologie of WIL: OVGHTRED,
against the tauderous insimulations of
RICHARD DELAMAIN, in a Pam-
phlet called *Grammelogia, or the Ma-
themathicall Ring, or Mirifica
logarithmorum projectio
circularis.*

 Honourable, and much honoured Gentlemen; I was
of late at my comming up to London, for the per-
formance of mine ordinary service in the house of
my most Honourable Lord the Earle of Arundell
and Surrey, and Earle Marshall of England, by
many of my loving friends presented with a most
idle and scandalous Pamphlet written against me by *Richard Dela-
maine*, who professeth himselfe a Teacher of the Mathematices
about the City: Wherein I am brought before you upon the Scaf-
fold, and with all the perulancies of a vexed mind and distempered
passion, insimulated and charged with, I know not what, injuries
he pretendeth I should have done unto him (your noble selves also
by him engaged therein, and incensed against me) and at last, as if
quite cast, I am schooled by him with a long Lecture or Common-
place against *Slaunger and Detraction*. I did much wonder at it, to
see my selfe so basely and impudently abused by one whom I never
had wronged, but had done very many courtesies for, giving him ac-
cess to my chambres in Arundell House day by day, teaching and
instructing him in that facultie he professeth: nor onely satisfying

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his scruples in those things he partly knew: but even laying the very foundation of diverse parts, whereof hee was utterly ignorant. And I did not so much marvell to see him so bold with me a poore man, but dust and ashes; as I was amazed to see him so fearlessly (yea without feare) to play with Almighty God, hypocritically and against his owne conscience in things apparantly false, invoking and challenging his all-knowing testimony: and in the middest of his most unmannery raylings, in his booke; and his slanderous backbiting and depraving me, by asdaicious intruding himselfe upon my most honourable favours with false complaints, utterly to overthrow and discredite me; in a perfornated admonition against such uncharitable calumniations, to pronounce judgement against himselfe. But of these things we shall, God willing, see more in good time. I borrowed and perused that worthlesse Pamphlet, and in reading it (I besure him for making me cast away so much of that little time in remayning to my declined yeares) I met with such a patchery and confusione of disjoynted stusse, that I was striken with a new wonder, that any man should be so simple, as to shame himselfe to the world with such a hotch-potch.

In the two first pages, (for so he afterward calleth them) are two Schemes of his Instrument. In the fourth page is his Epistle to the Kings Majestie. In the 5, 6, 7, are verses to his great commendation. In the 8 to the end of 21, he hath an Epistle opprobrious against me, most plainly still pointing me out, that he needeth not so name me: and therein most learnedly disputeth with me his jealous opposite, and the supposed, and assumed author, and divu'gr, and what not, in sixe whole leaves, a question about the asse's shadow, I should have sayd, whether the ring, or the Index at the center, bee the better? that word BETTER cruelly wrings him. What, such a comparison of BETTER? such a comparative aspersion of BETTER? Too great, and too loose an aspersion: An unsavory report indeed: which favours of too high a conceit of the one, and too great a detraction from the other: Endeavouring, what in him lyeth, to annihilate and beate downe the way, which I write upon, and to glory in the rasing up of his supposed owne: thereby not onely possesting men with an untruthe, but making me also ignorant in M^t choyce, that I should leave unto the world the weakest and imperfekte part of the projection of the Logarithmes, and leave the best for another to write upon. I never thought, when I first writ upon this my invention or my name so to come to the worlds rumour: which may reach ME and others carefullness hereafter (yea and fit it should) how and what we publish to the world: seeing there are such carpers and maligners, such busy-bodies, who marre what others make: such who have flings like Bees, and arrows.

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rowes to shooe : sharp-witted Critickes, Diogenes-like snarling, who while they will needs have many callings, neglect their owne. Good Sir be pacifyed : who troubleth your patience ? I, whom you make your adversary (a better friend then you deserve) never, I assure you, delivered that comparative attribution : I disclaime it utterly : I never made comparisons with you : you must seeke you some other antagonist. And now what is become of your angry question of BETTER ? it had been much better, and more for your honesty, to have held your peace.

But we will goe on in your Pamphlet. Next followeth a second Epistle to the Reader, Pag : 22, 23, Then the projecting and dividing the circles of the Ring, from pag : 24, till the end of 43. Wherein you please your selfe much with a portentuous invention of your great Cylinder, for a study (he that will be at the charge (subaudi) were a great foole) of a yard diameter : which brave conceit doth so elate, or rather elate you, that in the very next leaf you must needs give me a lash : very wisely unveyling a great secret about the circle of equall parts. After this, twentie two whole leafes being already past, you beginne in pag : 1, with your Pamphlet printed 1630 ; worthy indeed for the learnednesse of it to be enrolled in this disorderly band. And then is token of triumph, pag : 24, you set up a banner of other encomiaisticall verses.

Let me now see whither we are come : and we had need looke about us : for here is a vast hiatus, a huge Gulfe. And upon an instant from pag : 24 we are hurryed to pag : 53 : Where tenthly we have a third Epistle to the Reader, that promiseth him wonders in Astronomie, Horologyraphy, in plaine triangles, applyed to dimensions, Navigation, Fortification, &c. marry this &c. was well put in : but it had done passing well two lines before. Yet you have provided well enough for all that : you have left a great lacuna, that what you have no skill in now, peradventure you may hereafter picke out of the labours of some other : and then challenge it as comming within your intentions : and thence supply your vacuum.

After all this he rambleth backe againe, by way of introduction : of the examination of the graduation of the circles of the ring : which may serve as an inducement and furtherance to the learner, to fit and acquaint him. What, are we no farther yet ? we have fairely rowled Syphus stone : but to make amends, we have a few scrambling uses in Astronomie, in Dyalling in plaine triangles, from pag : 56 to 67. And then the Flag of encomiaisticall verses, of p. 24, is again gloriously displayed in pag : 68. Fy upon foolery ! Fy upon vain-glory ! Fy upon

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upon such miserable penury of matter ! Now make roome : Here comes a new projection of circles enlarged, either by a moveable and fixed circle, or by a single projection with an Index at the peripheria, or center : for here is plenty and variety. A wondrous secret it is, that a man may divide either one circle, or else foure, or ten circles, or as many as one will, into 1000 equal parts. But here our *Vnvyster* hath a worse rub in his way. As spite would have it, this was first hit upon by one *Thomas Browne* a Ioyner : yet not one word of *Browne* : ouely I am a beame in his eye. And herein lyeth a mystery of his skill : He holdeth it no mastery to joyne forces with a Ioyner : but by setting on a bold face, if with petulant insolencies hee shall dare mee ; hee thinketh the attempt will bee more glorious. Wherein I thanke him for putting a little difference in his estimation for matter of art betweene me and a Ioyner. And yet there is another matter in it too. *Browne* hath done it in a Serpentine line ; and he in just circles : the very names of circle and Serpentine (though the things themselves are the same : the serpentine revolution being but two true semicircles described on severall centers) may to the ignorant (for such they are that *Delmaine* must perswade) seeme to intimate things different in nature : and so make good his claime against *Browne*. This part he cuts off short in two leafes onely ; reserving all the rest, that ought to be spoken thereof (which he will find harder then he conceiveth) to his large intentions.

But now (vvee is me therfore) my punishment is at hand. All the rest of this worthy Pamphlet, which is thirteene leafes (except the last page onely, which is also an Epistle to the Reader, the very same promising one, which was before in pag : 22, the former) is a most vile, unmannerly, and barbarous invective against me : full of untruths, full of malice, full of scandall, full of hypocritry. In pag : 73 I am argued of spreading unsavoury rumours : who (God knowes) have scarce so much as thought upon him, till this scandalous Pamphlet came to my hands : and of ignorance of his intentions ; whereas it partly hath, and shall better appeare, that I know his intentions well enough. Then followeth pag : 74, a fourth Epistle to the Reader, short, but very quick: that *the world hath bin abused, as well as himselfe, with a false rumour rayed by some rude & ignorant tongue: by their malicious phantasie: and that he (good soule) did not intend to take this course, but sought peace, and his right by a private and friendly way: but sayling of it, his good intentions scorned and slighted, maketh the ensuing discourse his plea.*

Noble Gentlemen, excuse I pray you my most just indignation. While he was ridiculous and vaine in his opprobries, I dallied with him.

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him: now this so deepe taxing me of want of charity, in refusing peace sought, and prosecuting contention and discord, contrary to my Christian duty, pierceth to the quicke: whiche only scandal-full calumination had it not been, I had scarce vouchsafed an answere to all the rest. Impudent and impure mouth, for ever be thou stopped, that delightest in slander, and with lyes cuttest like a sharpe razor! When didst thou ever *seeke peace of me*, and I refused it? when did I not but most mildly and modestly behave my selfe unto thee? returning thee good words for ill: whiche my Christian humility thou hast, it seemeth in thy pride interpreted abjectnesse, and growne thereby more impotunate and unreasonable. What have I done? what have I spoken at all, with which thou canst justly charge me of wrong? how many wayes hast thou most intollerably provoked me, by raylings to my face, and threatening thou wouldest *overtop me*, by letters into the countrey; and all to urge me to impatient speeches, that thou mightest get occasion of a sue at law, as thy selfe acknowledgest, to have a personall action at the Kings bench Barre against me? When I was from London, thou madest enquiry after me and my comming up, in a distempered and threatening manner. When I came to London, thou soughestest me out, and openly in the audience of divers witnessesse reviledst me about my book & instrumēt called *The circles of proportion* (which yet I set not out, nor ever sought to make one penny benefit by) while I onely stood silent and amazed to see thy audacioufnesse and desperate conscience: till at last extreamely provoked with thy braving reproaches I onely sayd, what strange impudence is this? You know that I know what is in you, and that you have no skill in diverse arts, which in your table you professe: or if you have any, you may thanke me for it: and that you have and might have made better use and benefit of my friendship, then by these challenges you are ever like to get. And you answerd, then belike I haue all I shal have. And I said, unlesse you can better deserve it. Afterward when I was in the countrey above a quarter of a yeaer together, in derision of my calling you sent some Porter dressed up like a wandring Minister, with a scandalous letter, full of injurious expostulations of wronging you in print, which I never did: of stealing your invention, which is as false: of traducing the dead: of intruding my selfe into your calling: and neglecting mine owne: and such like peaceable stusse, which letter I would not keepe, left by it I might hereafter be provoked against you: but closing it up againe, delivered it to the Porter, willing him to returne it backe into your hands, and bid you peruse it with a better mind. And when afterward I sent up to you a *Canos of fines, tangents, and secants*, which I had borrowed, you asked if I had not also sent some scornefull answere to your letter. After this (dispa-

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ring to get any advantage out of my words) you shamelessly excla-
med upon me to my Lord Marshall, and to my Lord of London,
and to as many of the Nobility, Gentry, and Clergie, as you
thought I was known to; that so by depriving me of my friends
and hopes, you might procure my utter undoing. Is this your *Chris-
tianity*? Is this a *private and a friendly way*? is this to *seeke peace*?
are these your *good intentions*? which because you had not your
wicked purpose in, you hold as *slighted and scorned*: and God grant
that they may be ever so *slighted and scorned*, that is frustrated of
their divellish intentions and desigues, as many as have evill will
against the innocent. Thus have you seene in him (honoured Gen-
tlemen) the lively character of a querulous, clamorous, injurious,
ill natured man: that like an angry curre can together bite and
whine: crying out upon wrong, when hee himselfe is the only
wrong-doer.

But reason is wee shalould heare his plea: in which hee still playeth
his owne part, that is of scurrility, calumination, out-facing, and hy-
poctisy. A pitifull case it was indeede that the world shoulde spie out
his vanity in assuming to himselfe the first discovery of the Horizontall
projection and circles of proportion: *It was a malevolent dis-
position of envious detracours: famouring some, and infamizing others:
which did not a little disturbe the quiet and peace, which formerly hee
enjoyed:* when in his greedy hopes hee had swallowed downe the
golden baite of vaine-glory, and of a large fee out of every Instru-
ment the workeman shoulde sell. *But also slacked his intentions:* or
else there had beene yet *greater helpe for such as affect Mathematicall*
(he would have said Manuall or Instrumentall) *practices:* *Not out of
mercenary respect, nor interlaced* (O stay there: tell the very plaine
truth: and say, *Not without mercenary respect: interlaced*) *with
detracions & bumbast stuff by way of illustration, if not confusion:* *Had he
not bin prevented by some others, whose callings might have invited them
to spend their houres better: and which have work enough at home:
whose ambition to bee somebody bath incited him forward to deliver
some supposed new fluffe, or scrambling pieces, if not confused frag-
ments of his owne, or some others to a publicke view, in obscure and
various phrases: a thing supposed to be forged of sundry heads, rather
then one alone: seeing there is such roving from the text: onely so farre
to be trusted, as is agreeable to the text and doctrinall methode: amongst
whom to blow some smoke thereto, there was some grosse one, seeing the
matter is so common; for to a fater element perhaps his capacity could
not assent, or ascend: Yet there was some honest shewne not to take
the crop, but the gleanings, holding it easer to follow a beaten path, then
to hazard a discovery. *A blind guide, and a Parast speech are not much
different:**

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different: the one walkes he knowes not whither, and the other speakes he knoweth not what: and such are all precepts in arts, which leade, and make men speake without demonstration: which doe not onely protract the studious, and frustrate the affectionate, but maketh an ingenious spirit (who is ever more rationall then practicall) to contemne such circumlocutions, and laugh in private, if not in publicke, at the learned stile of some Authors making themselves by their obscure klad of writing seeminglly famus, sticke not to calumniate others to make them infamous: It is an anciente Proverbe among us, Good wine needeth no bush: But the wine must not be fast lockt up there, that none can come by it, if so it wants both bush and key. Excellently scolded: even so I have sometimes at a publicke Conduit heard a Tankard-woman in her furious and rayling fit; till she hath runne her selfe quite out of breath, and sense. But *Richard Delamain*, are you so mad upon the frustrated prey of your vain-glory and lucre, that neither the sacrednesse of my function, nor the reverence of mine age, nor my many good deserts, nor my innocencie of any ill demerite, nor your knowledge of some skill I have in those sciences, can escape the derision of your sardonickall laughter, nor the wound of your virulent tonguz? You are not in this fell passion to be reasoned with. Only I will soberly tell you that *William Forster*, whom you call a *Parrot speaking he cannot tell what*, is a farre more grounded Auctur in all parts of the Mathematicks then is *R. D.*: and better knoweth what belongeth to demonstration then *R. D.* doth: as may soone bee tryed. And as for my *Clavis Mathematica*, at which you make your selfe so merry, though I doate not, as you doe, upon mine owne (for I suppose you will not lay claime to that too) yet I confess I like it the better, because it pleaseth not your palate, to which nothing can favour, that is learned and Analyticall: but onely the superficiall scumme and froth of Instrumentall trickes and practices. It is you say hard and short: Did any man, I pray you, ever make a key, but of hard matter, and portable for the smallnesse? and yet it openeth an entrance into the most magnificent structures. I see you, and such as you are, looked for an Epitome: you were deceived: It is the way of rationall Scientialists, not of ground-creeping Methodicks. Hee that desirereth therein any resolution, to him I have in the Epistle, for the honour of my most illustrious Lord, in whose service and family I penned it, most freely profered my selfe gentle and courteous. He that liketh it not, may let it alone. But to him that can rightly use that key, it will unlocke the hardest mysteries of those Sciences, and of the writers thereof; as is not unknouerne to many, who to their great contentment have beene and are versed therein.

My calling ministreth to *R. D.* a diverse and contrary matter, both
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of mirth and scandal. His mirth I willingly leave unto him, as not unbecoming the rest of his good manners: for hypocrisy and prophanerie may well symbolize together. His scandal, being taken at the good gifts of God, cannot also but bee most unjust. For it is not without impiety to be affirmed, that any part of good literature is alien and abforient from the calling of a Divine: but that in all ages many of the most eminent in the sublimity of Theologie, have beeene also conversant in the study of the Mathematicks; most profitably making them to serve and ancillate to their highest contemplations: and they that have wanted such helpe, have heartily wished for it, and found in themselves the defect. And that in no other thing, after his sacred word, Almighty God (who creating all things in number, weight, and measure, doth most exactly Geometrize) hath left more express prints of his heavenly & infallible truth, then in these Sciences: in which onely the mind and understanding of a man can find secure rest and sure footing; all other knowledges being involved with a thick mist of ignorance and obscurity. Besides, that the exercise of these Arts accustomed to the certainty of demonstration, quickeneth the understanding, rousing it up from a lazie and drowsie indormition and servile assent to dialecticall and conjecturall probabilities, and spurring it forward, and supplying it with meanees, unto the accurate investigation of true and undecyble principles. Now tell me R. D. are these studies worthy of a Divine, or no? Indeed to know no more thereof then you know, that is to play with Instruments as a child doth with babies, or a Juggler (though the word trouble you) with his trinkets, is unworthy of a Divine, yea of a rationall man: worthy onely of some rude and reasonlesse dulman.

But he upbraideth me for *taking libertie enough to the losse of time: and neglecting my calling.* I must confess this scandal cutteth deepe: and hath with them, to whom I am not knowne, wrought me much prejudice and disdvantage, in answering whereof I must crave your patience in all humble modesty, to make a briefe recall of the course of my poore laborious and painfull life.

Next after Eaton schoole, I was bred up in Cambridge in Kings Colledge: of which society I was a member about eleven or twelve yeares: wherein how I behaved my selfe, going hand in hand with the rest of my ranke in the ordinary Academicall studies and exercisces, and with what approbation, is well knowne and remembred by many: the time which over and above those usuall studies I employed upon the Mathematicall sciences, I redemeid night by night from my naturall sleep, defrauding my body, and inuring it to *watching, cold,*

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cold, and labour, while most otheris tooke their rest. Neither did I therein seek only my private content, but the benefit of many: and by inciting, assisting, and instructing others, brought many into the love and study of those Arts, not only in our own, but in some other Colledges also: which some at this time (men far better then my selfe in learning, degree, and preferment) will most lovingly acknowledge. Ever since my departure from the Vniversity, which is about thirty yeates, I have lived neere to the Towne of Guildford in Surrey: where, whether *I have taken so much liberty to the losse of time, and the neglect of my calling,* the whole Countrey thereabout, both Gentry and others, to whom I am full well knowne, will quickly informe him; my house being not past three and twenty miles from London: and yet I so hid my selfe at home, that I seldomly travelled so farre as London once in a yeaere. Indeed the life and mind of man cannot endure without some interchangeablenesse of recreation, and pawses from the intensive actions of our severall callings: and every man is drawne with his owne delight. My recreations have been diversity of studies: and as oft as I was toyled with the labour of my owne profession, I have allayed that tediousnesse by walking in the pleasant and more then Elysian fields of the diverse and various parts of humane learning, and not of the Mathematics onely. In all which knowledges if I have attained to no more ripenesse and perfection, then to be reputed, and dared out by *Richard Delamain* with such contemptuous challenges, as a match scarce equall for him, it is surely a great meanenesse and defect of naturall gifts in mee (wherein I have just cause to be, and indeed am, humbled) and not altogether so much *my losse of time.*

About five yeares since, the Earle of Arundell my most honourable Lord in a time of his private retirg to his house in the countrey, then at West Horsley, four small miles from me (though since he hath a house in Aldebury the parish where I live) hearing of me (by what meanes I know not) was pleased to send for me: and afterward at London to appoint mee a Chamber in his owne house: where, at such times, and in such manner as it seemed him good to employ me, and when I might not inconveniently be spared from my charge, I have been most ready to present my selfe in all humble and affectionate service: I hope also without the offence of God, the transgression of the good Lawes of this Land, neglect of my calling, or the deserved scandall of any good man. And *R. D.* too, (if hee had so much grace or wit) may taxe himselfe of malapert sawliness to call in question the priviledges and wills of Noblemen, the dispensations of the Lawes, and the consciences of others, by such uncharitable and scandalous censures. But hee and his like must be suffered

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ferred to prescribe lawes for others, and not so much as keepe good manners themselves.

And althoough I am no *mercenary man*, nor make profession to teach any one in these arts for gaine and recompence, but as I serve at the Altar, so I live onely of the Altar: yet in those interims that I am at London in my Lords service, I have been still much frequented both by Natives and Strangers, for my resolution and instruction in many difficult poynts of Art; and have most freely and lovingly imparted my selfe and my skill, such as I had, to their concrements, and much honourable acknowledgement of their obligation to my Lord for bringing mee to London, hath beene testyfied by many. Of which my liberallitie and unwearied readinesse to doe good to all, scarce any one can give more ample testimony then R. D. himselfe can: would he be but pleased to allay the flame of this his hot and eager contention, blowne up onely with the full bellowes of intended glory and gaine; and to speake the truth. Yea neither is hee so unkind: but *some furtherance from mee in triviall matters bee doth and shall acknowledge freely*. This were an honest profession if it were with grataitide, and for love of the truth, and not to assert a greater untruthe: See his cunning: thus he argues: *I had not in the Horizontal Instrument the least touch of furtherance from him or any man breathing, either by transcript or verball direction*: for if I had, it may be presumed, I should as ingenuously have confessed it, as I doe freely acknowledge his furtherance in some other things. A fine piece of Sophistry that *Arifordis* never taught; by confessing a truthe to avert a lye. And marke howe *cautelous and subverfugions* (though he jest at the words) his acknowledgement is: *other triviall matters*. What doe you here acknowledge, when you reserve power to deny every particular thing? Well, wee will take what you please to bestow, they were *triviall matters*. Such a learned Authour as you are, to be furthered in *triviall matters*? If you need such *furtherance in triviall*, we shall suspect you in greater. Because you scorne to mention such *triviall* things, I will helpe you out with them: they were the first elements of Astronomic concerning the second motions of the fixed starres, and of the Sunne and Moone: they were the first elements of Conics, to delineate those sections: they were the first elements of Optics, Catoptrics, and Dioptrics: of all which you knew nothing at all. And diverse things also which you profess, whereof you knew very little. I recite not these things for exprobation: but that you may a little remember your selfe.

I have, I hope, even now cleared my calling, and claime that I may make to these arts of Mathematics, so far forth as I use them
I may:

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I may therefore with better manners aske you, how you obtained *that calling and profession*: for you challenge bothe names to your selfe. What Vniversity, what degree, what court of faculties, what other lawfull way, conferred it upon you? I believe you can answer me never a word: but will be horribly to steeke in your plea. Well, I will stand your friend once more, and helpe you out, and derive you a faire title to the inheritance of a *vulgar Teacher*. When you had learned to reade, you went to the Writing schoole: and can indeed if you list write a faire hand. Then you learned over your accident: Afterwards, I heard you say, you went into France (it may be to the Isle Iernsey) where your name got the French garbe: but little or nothing of the tongue brought you home with you. Next you tooke the degree of a *Instices Clearke*, or a *Dostours of Physick*, or both: to make Warrants or Mittimus, or it may be Recipe's, provided they were not in Latine, or in French. From thence you were advanced to keepe a Writing schoole in Drury lane: and so had opportunity to heare the Lectures at Gresham Colledge: and to have the benefit of conference with learned men. When you now thought you could cant in the Instrumentary idiome, you requested *John Th. mson* the maker of Mathematic Instruments in Holier lane, to helpe you to some Schollers. And is not this a faire pretence to the Mathematics: which you doubt not to call *Our noble profession, and our profession of so noble a Science?*

But lest I may seem to make good that crime of *Detractiōn* where-with he doth charge me, by detracting from him both French and Latine, contray to the fashion of his name, and the many shreds and thrummes of Latine he doth so artificially weave into the web of his Pamphlet, I will without any *flander* tell you a true story. Betweene foure and five yeares agoe, a young Dutch Gentleman whose name was *Dunbeſt* comming into this Land, sojourned in a friends house of mine in London: and because the Gentleman addidited himselfe to the warres, hee was desirous to have the helpe of some learned Teacher of the Mathematics. My friend thinking *Richard Delamais* to be such an one, sent for him; to whom the Gentleman spake (I cannot say signified) his desire in Latine: but our learned *Profeſſor* stared him in the face as if he wondred, but answered him not: which the Gentleman perceiving spake in French: but that was more strange: the Gentleman therfore making use of such little English as he had gotten, asked him, cannot you speak Latine? *No.* Can you not speake French? *No.* How shall I then that understand not English learene of you? And so our grand Master went away as wile as he came without his Scholler, which great misfortune of that poore young man to lose such learned *fundamentall Mathematicall* *call*

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call Doctrize may be a faire warning for all Gentlemen strangers to get them an English tongue in their heads, and that quickly: or else they are not like to have *their sight holpen* by this our great oculist and *unrayler of the subiect Richard Delamain*. But here by the way *some vsilevolous Detractor* may *spightfully collect*, that if our *Professors* Latine, and French, and Greeke be but mere contrefaict, which yet he doth so ventilate for his glory: his Mathematics may well be suspected to be of the same stiffe.

God knowes how unwillingly and with how grieved a mind I write these things, or so much as put pen to paper against him: But most indigneous and insufferable are the abuies offered by him to me, his scandalls, calumniations, bravings, and oufacing, and all mixt with more then Thrafonicall arrogancy, throughout his whole Pamphlet: which that hee may bee sure to scatter every where, he sendeth up and downe to his acquaintance by halfe dozens: and therewithall a letter, wherein he both requesteth to have them dispersed, and nameth to whom: and also bitterly inveighteth against me, and threatneth me, some of which letters have bin shewed to me: and it may be I shall prevale to have them produced. Besides in his daily talke to every man he bately traduceth me, and gloryeth in reading unto them his Pamphlet, and his letter which he sent me into the Countrey, marveilously pleasing himselfe at the sport he maketh with his scoffes and jests, acting them with his handis and the gesture of his body, and saying *here I come over him stately, here I give him a lash, here I scourge him*, with other such like contemptuous speeches. And also sendeth to me sometimes threatening, sometimes scornefull messages: challenging, and even daring me to make him an answer. What should I, what can I doe in this case? If I let him alone in all these his despightfull and inhumane injurie; all men may scorne me, and the very boyes in the street point at me; and he (as hitherto he hath done) by my patience and meekenesse grow into a higher degree of pride and insolencie, and be more obfirmed. I speake unfeignedly, that in my heart I pity him: and wish him not the least hurt: for he needeth it not: but this he needeth, to repente, and be humbled, that he may know himselfe, and his friends. I could have written much more, and more sharply: but lesse then I have done, and with greater mildnesse (considering the haynousnesse of his injurie, not only in print reviling and disgracing me publickly, but also by secret slanders and malicious clamourings labouring utterly to diseredite and undoe me) I could not write.

The Instruments I doe not value or weigh one single penny. If
I haue

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I had been ambitious of praise, or had thought them (or better then they) worthy, at which to have taken my rise, out of my secure and quiet obscurties, to mount up into glory, and the knowledge of men : I could have done it many yeares before this pretender knew any thing at all in these faculties. And when at *William Forstes* request I was contented to give way that he might publish them, I had not the least thought to be scene or acknowledged by them : but only to gratify and doe some good to *Elias Allen*, whom he very spitefully, yet more foolishly (contrary to the generall repute had of him in this and other lands) termeth *an unexpert Workman*. Now judge, I beseech you, had it not beene extreme simplicenesse in me, to stand by, and hold the candle ; while a vaine-glory braggard, who had by mine, and *Elias Allen* meane gotten the overtur of those Instruments, should so perke up himselfe in stolne feathers, and audaciously outface me in mine owne : and make *Elias Allen* his farmer for my free gift, not to worke, but at his devotion, and for his profit ? Might not I then justly have beene laughed at, and stiled the Bawde and Pandar of the vaine-glory, and shamefull lucre of *Delamain* ?

But he *pleadeth* hard for them, you will say ! and I have not yet answered his allegations. Neither indeed will I at all : there is in them no shew of argument ; but onely presumptions, braggings, bravings, outfacings, beggings of credit, scoffings at me, and reproachings. Will any *Reader* but an *affectionate* one (and *affectionate* he had need to be and partiall) be perswaded with such pitifull stoffe ? Honour'd, and most worthy Gentlemen, I will lay downe those two Instruments, *the Horizontall*, and *the circles of proportion* at your feet : and onely in the plaine word of an honest Christian man, without any one *braving lye*, open to you the very truth of both, which I doubt not but you will acknowledge together with me : and when I have spoken, if you shall be pleased to adjudge, and bestow them upon him ; let him take them with all my heart, and make his best of them.

Of the Horizontall Instrument.

Long agoe, when I was a young student of the Mathematicall Sciences, I tryed many wayes and devices to fit my selfe with some good Diall or Instrument portable for my pocket, to finde the houre, and try other conclusions by, and accordingly framed for that my purpose both Quadrants, & Rings, and Cylinders, and many other compositions. Yet not to my full content and satisfaction : for either

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either they performed but little, or els were patched up with a diversity of lines by an unnaturall and forced contexture. At last I considering that all manner of questions concerning the first motions were performed most properly by the Globe it selfe rectifyed to the present elevation, by the helpe of a moveable Azimuth: I projected the Globe upon the plaine of the Horizon, and applyed to it at the center, which was therein the Zenith, an Index with projected degrees, for the moveable Azimuth, in which projection I first found what I had before with much studie and paines in vaine sought for. And because I seldomly came to London, where I might have the helpe of large Compasses, and other Instruments, for drawing the arches of very big circles: I was forced to betake my selfe to such shift, as Art would afford me: and invented many Theoremes, problemes, and practises (such as no man before, that ever I could find, had delivered) for the finding out of the intersections, and all and every points of all those circles, by which I might draw the same, and divide them being drawne. Which rules I have yet in my paper booke, carrying their antiquity in their very shew: and are acknowledged by this challenger to have beeene scene by him. And though I invented them being young, yet they will passe the skill of his gloriosity, but even fitly to apply them to use, much more to demonstrate them.

About thirty yeares since I presented one of them drawne with mine owne hand to the truely reverend Prelate Doctour *Eylson* Bishop of Winchester, by whom I was made *presbyter*.

About five and twenty yeares agoe I bestowed one upon a noble Ladie, the wife of a worthy and learned Knight, then abiding neere the place where I live, but since dwelling in Worcestershire; which Lady with ingeniosenesse and solerte more then femeinine tooke delight in the speculation and use of the Globe. And for her I wrot many notes upon my Instrument, the very same almost word for word, which many yeaeres after I sent in a letter to *Elias Allen*; and are they which *Delamain* acknowledgeth to have *seen*, but *slightest*. I remember I did upon that Instrument tricke out in colours and mettall, the coate armes of both those families joyned in pale, the draught of which armes I yet have together with those rules. And I doubt not but that noble Lady doth as yet keepe that little Instrument; and will be pleased for the vindication of my credite to produce the same.

In the Spring 1618 I being at London went to see my honoured friend Master *Henry Briggs* at Gresham Colledge: who then brought me

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me acquainted with Master *Gunter* lately chosen Astronomic reader there, and was at that time in Doctor *Brooks* his chamber. With whom falling into speech about his quadrant, I shewed him my Horizontall Instrument: He viewed it very heedfully: and questioned about the projecture and use thereof, often saying these words, it is a very good one. And not long after he delivered to Master *Briggs* to be sent to me mine owne Instrument printed off from one cut in brasse: which afterwards I understood he presented to the right Honourable the Earle of Bridgewater, and in his booke of the Sector printed six yeares after, among other projections setteth down this: herein ingenuous that he did not challenge it to himselfe (as our challenger doth) but not ingenuously enough acknowledging from whom he had it. But such is the providence of God, I kept that very letter of Master *Briggs* wherein he sent me that print from Master *Gunter*, dated from Gresham Colledge 2 Jun. 1618: and the postscript 4 June: and which came to my hands June 10. In which letter are these wordes *Master Gunter doth here send you the print of a Horizontall Diall of his drawing after your Instrument.* This very letter hath beeac left by me in the hands of *Elias Allen* above these two yeares to be seene of any one that will require it. Yea and our challenger himselfe in his Epistle to the Reader before his booke of the Horizontall quadrant doth acknowledge the fift of this letter, and setteth downe the very words. Which maketh me wonder at the stupiditie of his audaciousnesse, so without all shame and sense contradicting himselfe. Vnlesse he thinke to have this evasion, that I devised the projecture, but knew not the use of it when I had done. I preethee R. D. why did I shew it to Master *Gunter* then? was it only for the pictures sake? And what did he like it for? because it was so fairely lineated? Or was it not for the excellent and copious use it hath above any other Instrument of that nature? But heare his plea, or rather his play and juggling with God and man, and his owne conscience: *The extreure of Gods hand in his donations is manifold, and when his spirit pleaserb to breath there is a doore opened: they posseſſe the world with a contrary opinion, thereby wronging God in his dispensation, and man in his reputation.* Gentlemen, doth not your hauie stand an end with horrour at such prophane hypocryſy? for shame ſeuent. but why doe I call for shame where is none?

About two yeares after I had shewed that my Instrument to Master *Gunter*, I bestowed the very ſame individuall one upon a young Gentleman, now a Baron, my very honourable and moſt intire friend, a man full of vertue, full of learning, full of all goodnesse, and true nobility, whose only defect and fault is an unquenchable thirſt after knowledge and good literature; who hath yet the

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very same in his custodij: and is at this present in London: whose honourable word and testimony will confirme that he himselfe so many yeaes agoe knew the uses of that Instrument: and yet our challenger never ~~unrayled~~ it to him: nor dareth prescribe for so long time.

In Michaelmas Terme 1627 I came to London, and *Elias Allen* having beene sworne his Majesties servant, had a purpose to present his Majestie with some New-yeares gift: and requested me to devise some pretty Instrument for him. I answered, that I have heard his Majestie delighted much in the great concave Dyall at White-hall: and what fitter Instrument could hee have then my Horizontall, which was the very same represented in flat? and that I would upon the backeside set the theorics of the Sun and Moone. And so by helpe of both sides Eclipses might be calculated with great facility. He liked it well. The Horizontall side was begunne by my direction. I was not long at home, but Master *Allen* being at a stand in his worke, sent to me for helpe. I wrix him a large letter two sheets of paper long: wherein I taught him the uses of the Instrument especially the Horizontall: and afterward the fabric or delineation of it: and how to find the semidiameters and centers of the severall circles both great and lesser, and the way to divide them. Which letter Master *Allen* yet keepeþ: and is the same I speake of before: and which *Dilamain* confesseth he ~~saw~~.

Observe here I pray you, the *subject* even by his owne confession was ~~unrayled~~ before he meddled with it. And I would to God Master *Allen* had in good time finished up that Instrument: I wrix it for the challengers sake: it might have saved him from a great deale of sinne and shame. But hereby we may discover his worthy *intentionis*, whereof he braggeth so much: Hee seeing Master *Allen* to neglect it, and my selfe not to make any great account of it, tooke it up as a *wayft* or *stray*: and had a purpose long agoe to have *famouséd* himselfe thereby: first calling it the *Grammelogia*: And then had hee been pitifull to seek of a new name for the Circles of Proportion, an Instrument not yet in *retura natura* with him: for now his *Greek Nomenclator*, and oracle the Schoole-master of Saint Clements was defected by death. Yet the name *Grammelogis* would serue as well for the other Instrument, as loone as he had heard of it; although by a spightfull accident he (being not yet ascended to the height of a profligated shamelesnesse) was hindred in the production of that his first plagiarius birth.

For some good tract of time after this, when I was now in my Lords

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Lords service, and *Delamain* frequented my chamber: One day after he was gone downe: another man came up and told me, that *Delamain* was in Master *Allen* shop showing unto diverse a little Instrument in brasie of a triangular or rather harpe-like forme, with which he could performe all the questions of the Globe for any part of the world, and make Dialls, and describe Countries, and carry Mines under the earth as farre as betweene Temple barre and Westminister, and such like wonders, which I knew impossible for any such Instrument to performe. I said surely he mistooket for but now he went hence: and had neither then, nor at any other time, ever spoken of any such matter: which I was sure he would have done, had he any such thing in his mind: But he still affirming it: I had a great desire my selfe to be a witnesse of that wonder. I came to *Elias Allen* shop; but he was gone. I told *Elias Allen* what I had heard: and said I would goe to his house, and see it. I came to his house pretending some other occasion. He shewed me a great quadrant of *Gemina Friesius* he had begunne: and after that a quarter of the *Analemma*: which I viewing told him that the Meridians were falsely drawne. Indeed said he I cannot make them answer to any Center. Whereat I smiling sayd, it is no marvell, for they are not arches of Circles: and shewed him the reason why they could not be. What are they then said he? They are Ellipses said I. Ellipses said he, what is that? I told him: and discoursed of the kinds of Conic sections, the first newes that ever he had heard of any such thing. Well, at last I asked him for the strange Instrument he had shewed: and would not be answered but he must needs shew it me: which with much tergivertion he did. Tush said I, this is nothing but halfe my Horizontall. which he also acknowledging: I asked who drew it? my selfe said he. Is it possible said I that you that cannot make the *Analemma*, shoud draw this projectio? Doe you know the use of it? Yes said he: I have written some notes of the uses of it: and shewed me some papers: which I looking upon saw the very notes I had declared in my letter to Master *Allen*: but here and there the words disguised after his owne apprehension. I wear homeward: and seeing Master *Allen* in his shop, said to him, I pray answer me a question, but answer me truly. he perceiving what I meant to aske, prevented me with these words, indeed I did: he had the letter of me a whole fortnight, almost as soone as you sent it: and I believe he writ it out: for the summer following, unknowne to me, he got my servant to make it for him: for which I was angry. The rest of this busynesse let Master *Allen* himselfe tell you.

Well: this might have beene all spared, you will say: the fift

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of that letter and of those uses is confessed: but *they were ordinary, meane, and triviall*: and he slighted them. That my very letter is yet extant at Master *Allens* making appearance to answer to the disgracefull taxations of *Richard Delamain*. In which letter dated December 3. 1627. you shall find these uses following.

- “ 1 To find the declination of the Sunne every day.
- “ 2 To find the course of the Sun; or the parallel which the Sun runneth, or describeth every day.
- “ 3 To find the rising of the Sunne, and his setting; and the diurnal arch or length of the day, or of the night.
- “ 4 To find the distance of the Sunnes rising and setting from the East and West points, Northward in summer or Southward in winter, called the Amplitude Ottive.
- “ 5 To find the true place of the Sunne on the Instrument at any time of the day.
- “ 6 To find the houre of the day.
- “ 7 To find the Azimuth or verticall circle in which the Sunne is: or the Horizontall distance of the Sunne from the Meridian.
- “ 8 Againe the Azimuth of the Sun being given, to find the altitude of the Sunne, and the houre.
- “ 9 To find at what houre the Sunne commeth to be full East or West every day in summer
- “ 10 To find the height of the Sunne at high noone every day, and likewise at every houre. Whereby is made Master *Gunters* Quadrant, and all other Quadrants of that sort, described by *Gemma Frisius, Munster, Clavius*, and others: also all manner of Rings, Cylinders, and innumerable other Topicall Instruments, for the finding out of the houre, and other like conclusions. And likewise the reason of finding out the houre of the day by a mans shadow: or by the shadow of any gnomon set up perpendicular to the Horizon, or else parallel to it.
- “ 11 To find out the Meridian line, and the points of the Compass without a needle: yea more exactly then with a needle.
- “ 12 To find the declination of any wall.
- “ 13 To find at what houre the Sunne commeth unto any wall, or window every day in the yeare: as also when it leaveth it.
- “ 14 To find how many, and what houre lines are to bee drawne in every plaine Diall.
- “ 15 To find how low the Sun is under the Horizon at any houre of the night: and in what point of the Instrument the true place of the Sunne then is.
- “ 16 To find in which of the twelve houses the Sunne is at any time of the day, or night.

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“ 17 To find the length of the crepusculum or twy-light every day.
“ 18 To find out the houre of the night.
“ 19 To find the signe and degree in which the Sunne is every day.
“ 20 To find the declination of the Sunne every day.
“ But I could beside these adde diverse other operations to be performed by the Instrument as now it is: and many others with some additions to the Instrument: as namely the degree of the $\text{\textcircled{E}}$ quinoctiall in the Meridian at any time: and the degree of the $\text{\textcircled{E}}$ quinoctiall in the Horizon East and West: and the degree of the Zodiac in the Meridian called *Cor celi*: and the ascendent degree thereof called the Horoscope: and concerning the twelve houses of the heavens for the erecting of a figure: and concerning the ninetyeth degree of the Ecliptic above the Horizon, and the altitude of it. and I know not what else, or rather almost any thing else.

These are the ordinary, meane, and triviall uses, which I delivered, and are to be scene in my letter. And hath *Delamain* unrayled any I doe not say more (for he runneth division) but other uses then I have done? Yes marry hath he. for in his booke of his *Horizontall quadrant*, from pag: 44 to 51, you shall find these uses.

Eighth-ly, to fid the inequality of time in equall moneths, or equall number of dayes.

Ninth-ly, to fid the degree of the $\text{\textcircled{E}}$ quator in the Horizon by supposing the degree of the Ecliptic in the Horizon.

Tenth-ly, to fid the degree of the Ecliptic in the Horizon by supposing the degree of the $\text{\textcircled{E}}$ quator in the Horizon.

Eleventh-ly. But if the degree of the Ecliptic in the Horizon were required by knowing the degree of the Ecliptic in the Meridian.

Twelf-ly, to fid the Horoscope, or the degree ascendent, or descendent, and the Nonagesime degree at any houre.

Thirteenth-ly, to fid what angle the Ecliptic maketh with the Horizon, or the altitude of the Nonagesime degree of the Ecliptic above the Horizon: and what Azimuth it is in at any houre.

O Sir (may *Richard Delamain* say) now I have overtopped you: in these things you can not deny, but that I have unrayled the subject to helpe your fight. Nor so neither: for every worke is ascribed to him that first found it out. Nor is the Author therfore to be accounted ignorant, or to want fight, though some other after him shall make some addition or accesse thereto: seeing it is an easy matter to adde to an invention once discovered. But yet let us see what learned and rare uses those are, which you have unrayled.

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The eighth is utterly alien from this Instrument: and requireth necessarily the knowledge of the true, and proper motion of the Sunne, which this Instrument giveth not at all: and of the exact right ascension, which this Instrument giveth but at large: and so is this use of no use, but a vaine flourish.

The ninth is nothing else but to find out the Sunnes oblique elevation.

The tenth, eleventh, twelfth, and thirteenth (which indeed were excellent uses, if he could shew them) are utterly false. In all which you have *unrayled* nothing but your owne want of skill, and most grosse ignorance of the very ground of this projection. And now have you not very faiely *holpen my sight*, and the sight of others, to see your rashnesse and lacke of art? which all your facing (though your face, if it be possible, were harder then it is) will neuer bee able to make good.

Yet for all this (and now I challenge you) let us see the performance of these questions upon the Horizontal Instrument, with what reasonable addition you can, which shall not quite alter the nature of it: and I will freely acknowledge you to be a man of art: and not at all impate unto you any *plagium*, or Mounte-banke tricks.

But seeing you have already *unrayled* your want of wit, I will take a little paines for you to *unrayle* your want of honesty; to *helpe the sight of these Gentlemen our judges*, to see what trust they may repose in such an Instrument-monger and player of leger-de-la-main, as you are. While hee was printing his tractate of the Horizontal quadrant, although he could not but know that it was injurious to me in respect of my free gift to Master *Allen*, and of *William Fister*, whose translation of my rules was then about to come forth: yet such was my good nature, and his shamelessness, that every day, as any sheet was printed, hee sent, or brought the same to mee at my chamber in Arundell house to peruse, which I lovingly and ingenuously did, and gave him my judgement of it. When we were come to the said pag: 44, to 51, I gently shewed him the fality of those propositions. And he said, cannot they be wrought then? No, replied I, not by the Instrument as now it is, without some addition. I can worke them; but you cannot: he asked, why cannot I as well? I answered, because you are ignorant of the ground of this Instrument and projection. What shall I doe then? said hee, you must, said I, be content to lose that sheet, and new print it: After a little parvise, he was not ashamed to resolve with these very words, though

your

your sight be so sharpe, that you can note these faults, yermany hundreds that shall see the booke will never be able to fyse them. and withall told me that he had penned that booke in a fortnight with great hast: I said I did easilly beleive as much: for *Canis festinans cacos paris canos*. This was at that time our communication, and his gallant resolution. And if this be not jugling, never did any Hocus-pocus joggle. That unlesse a man were given over to shame and shamelesnesse: he would never so shamefully abuse his learners, and so shamelesly hazard his (I cannot say good) name, and reputation. Yet sticketh he not wot vainely (that I may say no worse) to conclude his said booke with this braving flourish, *But if any man desire to say more upon this Horizontall quadrant, then I have done, I have made way for him, and unvayled the subject to helpe his sight.*

But he saith the projection was none of mine: for *Munster* hath it and *Blagrave*, and some others, this latter wirt some yeares since I beganne to use this Instrument: and that in *Munster* is no projection, but a resemblance of a concave Diall: which likenesse can no more argue this Instrument, then *Delamains* blacke clothes can prove him to be a scholler. And it were a wonder, that seeing the writers of these Arts doe imagine their Diagrammes upon the plaines of severall Circles, as occasion requireth: if none should be found that have made their delineations upon the plaine of the Horizon. But of such as ever have used the same for an Instrument, before me, he neither can, nor hath shewed any.

Of the Circles of proportion.

FOR these I must freely confesse, I have not so good a claime agaist all men, as for my Horizontall Instrument: though agaist *Richard Delanain* I have. The honour of the invention, next to the Lord of Merchiston, and our Master *Briggs*, belongeth (if I have not been wrongely informed) to Master *Gunter*, who exposed their numbers upon a streight line. which being once done, was there any such master to bring the same line about into a circle? And what doth this new Instrument (call it the *Circles of proportion*, or call it the *Ring*, or what other name you list) ought else, but onely bowe and inflect Master *Gunters line or Ruler*.

The manner how I fell upon it, was thus. I have in my studie and practice of the Mathematics been not a little conversant in calculation. And that I might both facilitate the labour, and try the worke: I intended many solerites and compendiations in logistica, for the

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one: and framed diverse kinds of Instruments and mechanicall practices, for the other: that when I should find the performance in both wayes not to disagree, I might be assured of my just dilligence in numerary computation. Among other Instruments I much liked the same line or Ruler: onely this defect I found that it required many times too great a paire of Compasses, which would bee hard to open, apt to slip, and troublesome for use. I therefore first deviled to have another Ruler with the former: and so by setting and applying one to the other, I did not onely take away the use of Compasses, but also made the worke much more easy and expedite: when I should not at all need the motion of my hand, but onely the glancing of my sight: and with one position of the Rulers, and view of mine eye, see not one onely, but the manifold proportions incident unto the question intended. But yet this facility also wanted not some difficulty, especially in the line of tangents, when one arch was in the former medietie of the quadrant, and the other in the latter: for in this case it was needfull that either one Ruler must bee as long againe as the other; or else that I must use an inversion of the Ruler, and regression. By this consideration I first of all saw that if those lines upon both Rulers were inflected into two circles, that of the tangents being in both doubled, and that those two Circles should move one upon another; they with a small thread in the center to direct the sight, would bee sufficient with incredible and wonderfull facility to worke all questions of Trigonometry both right-lined and Sphaericall. And according to this my speculation, above twelve yeares agoe, I with mine owne hand made me two such Circles, which I have used ever since, as my occasions required.

In the long vacation 1630 I shewed both the Rulers, and the Circle to *William Forster* (somewhat more p̄maturely then for the desire I had to leade him on in the right way of Art, I intended) at my Parsonage house, as in his Epistle before his Translation hec doth himselfe testify. To whom, exhorting me to publish them, I said I would not appeare to the world in such toyes: but if hee would take the paines to translate some rules I had written into English, we would bestow upon *Elias Allen* (if he shall thinke they may bee beneficiall to him) both those Circles of proportion, and also another Instrument, consisting of two halfe circles most plainly and easily giving the Proportions of the Planets according to the Theory of *Copernicus* (which I have had fairely drawne with mine owne hand above these twenty yeares) which might be set upon the other side of the plate: and would together make up the most compleat Instrument for all Altronimie, that ever yet to my knowledge came forth. And of this intire Instrument at my comming up to London

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don in Michaelmas Terme following, to attend my service, I did accordingly make a most free donation to *Elias Allen* by the ingagement of my promise. And had also performed it long agoe (I doubt not but to your good contestement) had not this Trifler so unseasonably blurted out his scribble-scramble of *Grammelogia*, like an unlicked Bear-whelp. Wherein under ambiguous words, and large unlimited intentions, and the generall names of *Circles*, *Rings*, and *Grammelogia or declaration of lines*, hee endeavoureth very honestly to hooke in within his privilege, and to fasten upon as his owne, whatsoever invention any other Artist shall in a round or circular forme hereafter produce.

Will you be pleased to have an instance of this? Shortly after my gift to *Elias Allen*, I chanced to meet with *Richard Delamain* in the street (it was at Allhontide) and as we walked together I told him what an Instrument I had given to Master *Allen*, both of the Logarithmes projected into circles, which being lesse then one foot diameter would performe as much as one of Master *Gunters* Rulers of sixe feet long: and also of the Prostapharetes of the Plinnes and second motions. Such an invention have I said he: for now his intentions (that is his ambition) beganne to worke: but how wisely you shall see. He not considering the proportion of the circumference to the Diameter, which is more then triple, dreamd that I understood a Circle of sixe feet Diameter, by it to worke the Prostapharetes: as you may see in the very end of his tractate of *Grammelogia*, which so monstrous conceit never entred into my mind, but this may serve as a faire intention to lay claime to my Prostapharetical Instrument, if ever it shall come forth: whereof hee knoweth no more then the cap upon his head.

But he saith, Then after my comming home I sent him a sight of my projection drawne in past-board. See how notoriously he jugleth without an Instrument. Then after: how long after? a sight of my projection: of how much? More then seven weekes after on December 23, he sent to mee the line of numbers onely set upon a circle: which I marvell he should be so simple to boast of, seeing *Taylors*, and *Carpenters*, and other Mechanics about this towne, and elsewhere, yea and *schoule-boyes*, in imitating Master *Gunters* Ruler incurvated only into a circle, might have, and some have drawne, to more good purpose then ever yet *Delamain* did. and so much onely he presented to his Majestie: but as for Sine or tangent of his, there was not the least shew of any. Neither could he give to Master *Allen* any direction for the composition of the circles of his Ring, or for the dividing of them: as upon his oath Master *Allen* will testify how hee mislead

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miſled him, and made him labour in vain above three weeks together, untill Maſter Allen himſelfe found out his ignorance and miſtaking, which is more cleare then is poſſible with any impudeſce to be queſcaced. Yea and the concluſion of his tractate of Grammeſlogie pag: 22 doth plainly enough intimate as much: ſaying, *If there be composed three rings, &c. So if you move the ſine of 90 degrees unto the Tropical point, &c. Againſt the Circle of the tangents if you bring, &c.* Where you ſhall find his deepe intentions ſet downe in words then which Spynx it ſelue never had more implexed: and teacheth nothing, but mocketh his Reader, as I haue ſomtimes ſeen a child crying for a wild bird deluded, with bidding him get the bird, and lay ſalt upon the tayle, and ſo he ſhould catch it.

It will not be impertinent, but peradventure much to the purpoſe, that you may rightly know our Challenger, to let you understand how he hath dealt with the loyale Thomas Browne of whom I ſpake before. Richard Delamain hearing that Browne with his Serpentines had another line by which he could worke to minutes in the 90 degree of ſines: uſed a device to get Browne to come and bring his instrument to ſome place where he himſelfe ſhould also be: there he inſinuath with Browne pitifully complaining of the wrong Maſter Oughtred had done him, and to make the matter good readeſth to him in his Pamphlet, glorying much how he had laſhed me therin: and then gave the booke to Browne: who in thankfullerne could not but gratify Delamain with his Lines alſo: and teach him the uſe of them, but especially of the *great Line*: with this caution on both fides, that one ſhould not meddle with the others invention. Two dayes after Delamain ſent a Porter to Browne for the booke he had given him, because he had found ſome things to be altered therin, and that he would for it give him a better and more perfect booke. Browne refuſing to ſend it by the Porter, the next morning Delamain vouchſafed himſelfe to come to his houſe neare Algate: and asked for the booke, (Browne ſuppoſing he would then haue corrected it) but as ſoone as he had got it in his hands he rent out all the middle part with the two great Schemes: & put them up in his poſket: & went his way, leaving only what he blaſtered againſt me: and did not only thus to Browne, but laboureth to recall all the bookeſ he had given forth, (which were many) before the ſight of Brownes Lines. And ſhortly after this he got a new Printer (who was ignorant of his former Schemes) to print him new: giving him an elſeciall charge of the outermoſt line newly graven in the Plate, which indeed is Brownes *Very line*: and then altering his book and caking of wondeſters in Prophēties, he diſperſeth them by ſoures and fixes. But ſee how it pleaſed God (who conſoundeth the proud in their owne imaginationes)

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imaginacions) to bring to light *Brownes* right and *Delamaines* falsity. *Browne* himselfe was present when the Plate was brought to the Printer, and heard the charge given concerning the new line: and since by *Brownes* friends have beeene gotten diverse of *Delamaines* former booke and some Schemes of his Instruments, in none of all which that *great line of Browne* is to be found: And yet such is *Delamaines* audacity (not knowing what can be shewn) that he stands to it to *Browns* face, that the said *great line* was in the schemes in his former books. Wherfore we will (without stealing) borrowe our Authors own words, *The window hath bin as yet close, and darknesse possesteth the place, I now withdrawe the curtaine that the sunshining light may appeare to expell those misis that have beene scattered, and by a true and sincere medium remove that which by Rich: Delamain hath been falsly suggeſted.*

Well then, to come at last to a conclusion concerning the Instrument called the Circles of Proportion, as it is set forth, not having, as I have said, the one halfe of my intentions upon it; nor with a second moveable circle and a thread; but with an opening Index at the center (if so be that bee cause enough to make it to bee not the same, but another Instrument) for my part I disclaime it: it may goe seeke another Master: which for ought I know, will prove to be *Elias Allen* himselfe: for at his request only I altered a little my rules from the use of the moveable circle and the thread, to the two armes of an Index.

And now most noble Gentlemen my Readers and Judges, I humbly thanke you for the great patience you have shewed in hearing me also speake for my selfe. I doe not request of you any partiall respect or favour towards me at all: but onely what your wisdomes shall see the simple honesty of my cause doth deserve. And what sentence soever you shall be pleased to give herein; I will most submissively, without any fartherappeal, rest in it. Onely I shall beseech you to looke backe and consider whether *R. D.* hath any the least colour of shew for his so vile and base behaviour toward me, in scoffing, flandering, calumatiating, back-biting, and exclaiming against me: contrary to all rules of charity and Christianity, yea even of humanity and good manners. What wrong can he charge me, or indeed doth he charge me with, for which he may have a seeming ground of his so great malice? Was it because so many yeares before I ever heard of his name, I prevented him in the invention of those Instruments? That was the gift of God, and his prospering my painfull study. Was it because I have not made them more public all this while? That was my modesty. Was it because I at last produced them to light? Neither was this my doing, but permission

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only. Was it for not giving way to him, when hee was pleased to lay hold upon both, to mount up with the wings of vain-glooy by ? I withstood him not, nor once opened my mouth againt him : but rather furthered him. And if understanding men, knowing his inabilities, and seeing the folly and ignorance he fneweth in his Pamphlets, did even cry him downe, and almost with one consent and voice acknowledge the true Authour : I sought it not. Was it for not hindering *William Forster* to publish the translation, which with a great deale of labour hee had brought to an end : or not disavowing it when it was printed ? I neither had such power over him : nor any reason at all to frustrate his long taken paines, for the ambition of another. Was it for making comparissons with him ? I made none. Was it for my paines taken with him in teaching and instructing so ill natur'd a man ? My gentlenesse and good will deserved better respect. Or was it for my so long and patient bearing his injurious reproaches, and unmannerly bravings of me ? It was my meeknesse, humility, and good nature. What other cause he could have against me, in the very strictest examination of my conscience, I can find none. But hee had a mind to climbe, and thought my necke might make a fit step for him to get up by. Indeed such is the furious appetitie of some wicked men, after their ambition and profit, that not the fairest tyes of Christianity, friendship, or benefits received can with-hold them : but they will not sticke even to cut the throats of their best deserving friends, so that they may attaine to their intended purposes thereby. I pray God such be not his mind, for I heare he affecterh and is ambitious of public action and employmēt : and something he thinkes he must doe, that he may seeme somebody, and make himselfe famous.

Concerning that he hath in the behalfe of vulgar Teachers, and others.

There is yet a more fearefull Adversary remayning, at the very thought of whom I am straken with dread & trembling : which is your indignation and displeasure most honourable and noble Gentlemen, and you most learned and expert Professours of the Mathematicall Sciences : all whom this Challenger, as if his former injuries (most undeserved on my part) were too hitle, in the highest blaine of his malice laboureth to exasperate and incite agaist me: that *with words downe-right and pernicious should both glaunce upon many noble Personages with no graffe, if not too baser an attribute, by learning them doers of trickes, and as it were to juggling, checking you grossly, and abridging you of your liberties: and also by vilification should*

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should stile the Teachers of Mathematics vulgar (common Teachers he would have them called) ranking them with Juglers, and teachers of tricks. Farre be such unreverent and unmannely aspersions against you from me, ever to approach neare my thoughts : much more to proceed forth of my mouth.

And I beseech you observe with mee by what degrees his malicious ungratefulnes doth ascend to the height of calumination : first he saith, *my words, if they be truly scanned, rebound to the Nobility and Gentry* : then shortly after, *that they are donne-right in their plainenesse*. which two accusations seeme to imply a contradiction ; if they needed scanning, and yet did but rebound even now : how are they suddenly become *donne-right in their plainenesse* ? And lastly both openly in his Pamphlet, and in his rayling invectives against me in all company where he commeth, yea and (such is his impudence) to my face, that mouth which hath very often implored my helpe, and submissively acknowledged my courtesy, that very mouth, I say, hath not been ashamed most flanderously to accuse and charge me, *That in expresse words I should call many of the Nobility and Gentry doers of tricks and juglers* : which his bold and vise report, no doubt with many that know me not, nor the truth, but have given credite to his audacious assertions, hath bred me much envy and discredite. Will it therefore please such as have been so ill perwaded, to vouchsafe to accept of a true and briefe information : As I did to *Delamain* and to some others, so I did to *William Forster* : I freely gave him my helpe and instruction in these faculties : only this was the difference, I had the very first moulding (as I may say) of this latter : But *Delamain* was already corrupted with doting upon Instruments, and quite lost from ever being made an Artist : I suffered not *William Forster* for some time so much as speake of any Instrument, except only the *Globe* it selfe ; and to explicate, and worke the questions of the *Sphære*, by the way of the *Analemma* : which also himselfe did describe for the present occasion. And this my restraint from such pleasing avocations, and holding him to the strictnesse of precept, brought forth this fruit, that in short time, even by his owne skill, he could not onely use any Instrument he should see, but also was able to delineate the like, and devise others : yet for all this my severe hand I saw him obliquely to glaunce his eye upon such Instrumentary practices : whereat I being jealous, lest I should lose my labour, and he his end, which was Art : I brake out into that admonition which in his Epistle Dedicatory to *Sir Kenelme Digby* he (I thinke in my very formall words) cuttech downe. That the true way of Art is not by Instruments, but by demonstration : and that it is a preposterous course of vulgar Teachers, to beginne with Instruments,

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“ Instruments, and not with the Sciences, and so in stead of Artists,
“ to make their Schollers onely doers of tricks, and as it were jug-
“ glers: to the despight of Art, losse of precious time, and betraying
“ of willing and industrious wits, unto ignorance and idlenesse.
“ That the use of Instruments is indeed excellent, if a man bee an
“ Artist: but contemptible, being set and opposed to Art. And
“ lastly, that bee meant to commend to mee the skill of Instru-
“ ments, but first he would have me well instructed in the Sciences.
These words are to *Delamain* like a candle unto weake and rheuma-
tic eyes, his purblindnesse cannot endure the brightnesse of them, but
maketh him smart, and pricke, and vexe, and cry out, away with
this light it hurteth mine eyes, put it out: and merely out of the
detestation of this light, and the disproportion it hath to his weake-
nesse, those tragical exclamations, wherewith his unlettered and
unmanerly Pamphlet is stuffed, have proceeded. Other Teachers
of these Arts, men of learning and skill, have (many of them) and
do daily acknowledge the truth, & seasonablenesse of this admonition,
and are sorry for the wrong done unto Art it selfe under colour of
me: Only one *Richard Delamain* is found who forgetting truth,
gratitude, good manners, and very shame, doth bewray his gald back
by such impatient winching. Little did I ever suspect when I spake
these words privately at home, they should be scanned with so un-
charitable and malicious a censure. Honoured Readers consider I
pray you who it is that doth you wrong, and offereth you this con-
tumely: if it bee I who not so much as having the least thought of
any of you, privately tutored my learner with a modest, gentle, and
seasonable advertisement: or if it be not *Richard Delamain* him selfe,
that most insolently, to cloke his owne unskilfulness, and mislea-
ding you in Art, and juggling, doth put upon your ingenuities that
base imputation, as if he had made some of you only *Doers of tricks*
upon Instruments, and as it were taught you to juggle. What his course
in teaching is I know not: but what his skill is I doe perfectly know.
And concerning my honorable estimation of you most worthy Gentle-
men, I doe unspeignedly glory in the behalfe of this our native
Countrey, that no Land under the cope of heaven, is more happy
with a gallant, and glorious flower of Gentry, and which is more
liberally enriched by nature with ingenuity, and all excellent endow-
ments both of wit, courage, and abilities of mind and body, and
hath more propense inclinations to all good, then this our sweetest
and most indulgent mother of Great Britaine bringeth forth: only
if we can take care to plant in our minds the good seedes of virtue,
and knowledge: and not to neglect them to be overgrown (as the
best ground will) with the weedes of evill and contraryous habits.
whereunto on both sides no one thing conduceth more then the
wife,

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wise, or inconsiderate choice of Teachers, and Instructors. And then consider I beseech you what slight account this our glorious Challenger maketh of your worthyest endowments ; that having so long ordered your studies, disposed of your times, and received your money, hath even in his owne conscience done you so little good, that there being but the very name of *losse of time, juggling, and ignorance*, occasionally mentioned, is himself first of all ready most unmanerly for your ingenuity, yet more unadvisedly for his owne credite, to taxe you therewith, and pinne it upon you. And will you most clearely see how he seeketh not your good, but your intollerable expence, for his ambition and vain-glory, and no good at all of yours ? *His Ring* forsooth must be made of *Silver and Gold* : Brasse belike is too base, or he feareth the wafting of it, lest there may not be enough left to furnish his face. And they must be of *sixte feete diameter*, of which whether the monstroufnesse, unprofitablenesse, or exceeding charge will be the greater, I cannot readily tell, yet as if this were too little to exhaust your estate, he hath a far more hideous device then all this, that is a *Cylinder of metall* (Silver sure it must be) *three feet diameter, and of height sufficient to receive 100 or more moveable rings, and as many fixed*, having within it ingens, and movements, and I know not what *Automata* (nor he neither) for the turning of those rings, which by computation of skilfull workemen can hardly be performed for three hundred pounds : And when it is done, and you with a great deale of labour, can tell the use of it, you are not any way in Art the wiser, or better by three single pence : but in farre shorter time, and with much lesse labour, you may be taught with a booke of twelve pence to worke and performe farre more, and more exactly, then by that monstrous barrell *Delamare* himselfe can ever be able to effect. And doe you not now (most noble Gentlemen) cry shame upon such teachers ; shame upon such losse of time ; shame upon such profusion of money ; shame upon such vyle betraying of willing and industrious wits unto ignorance and idlenesse ; And many shames upon such dishonesty, to set out in print against his owne knowledge, so many false propositions, and precepts purposely to abuse the ignorance of his Readers, and that they may esteeme him for some extraordinary and more then a *vulgar Teacher*.

Thus have I answered to *the three parts of his plea*: And I suppose that by this time you wonder as well as my selfe, what just cause there should be of all his clamorous and malevolous inveighings against me. But you must give him leave to use his owne nature and manners. I am not the first, that have beene in this pecculant manner provoked by him. Who indeed hath escaped him ? The stirring humour.

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mour of some is, that if they thinke they know any thing, they love to make a great noise, and raise a great dust, till all become weary of them. Of this condition is our Challenger: whatsoever he hath, he must have it with such a breath, that all the world shall heare of it, and all that come in his way shall suffer for it. England is too little, and his mothers tongue too barren (and yet if his mothers tongue were like his, it were copious enough) to yeld him names, titles, inscriptions, and expressions. But France, and Greece, and Laffum must be raked and harrowed for him, to such a height of courage and spirit selfe-admiration hath wrought him. The Asse in *Aesop* having got on a piece of the Lyons skinne beginneth to stirre and ruffle among the Beasts. I am not only contented by him (for that mattereth not much) But that incomparable Master *Henry Briggs* the mirror of our age for excellent skill in Geometry, and therewith for exceeding meeknesse, was so vilified and slighted by this nisle in a bagge, a little before his death, that the good old man forgetting his owne mild nature, at his last departure from London, being on horse-backe for Oxford, and taking his leave of a friend, spake the last words, farewell, and tell *Delamain* from me that he is an absurd fellow. and that we *may not wrong the dead, but give every man his due*, we must suffer him to possesse the legacie of so worthy a friend. Yea and Master *Gunter* too (whom he would seeme to admire) escappeth him not without a shrewd lash. for in the beginning of his booke of the Horizontall quadrant pag: 3, he braveth him saying, *this Master Gunter delivers so OBSTRUSELY in his 66 page of the Sector, that if a man had not more fundametall Mathematical doctrine then his booke teacheth, he shoulde never attaine to it.* It is well for him Master *Gunter* is now to give him a second legacie: and to tell him a lyar had need of a good memory. for in that part of his *plea* which is *an answer upon his Quadrant* towards the end, hee writeth that *sayers, and Carpenters, and schoole-boyes, and sundry Gentlemen and others, having not had the least assistance from any, but the direction of Master Gunters Booke alone, as upon oath they have been examined, have drawne the projection fully and compleatly.* which two places being so quite contrary are worth your comparing, that you may know *Richard Delamain* aright.

Which his usage of Mr. *Briggs* and Mr. *Gunter* excuseth him the more that he is so supercilious & strange to others, who are also teachers of those Arts, and farre more skilfull then himselfe: diverse of whom I have heard complaine and stomach at *Delamains* standing so aloof, and keeping them off at such distance from him, as not worthy of *his noble profession*: & vehemently suspect, that besides his arrogancy, there was also a disidence, and feare, lest his ignorance might chance to heuyray it selfe, as doth an *Asse* by his long ears.

I must

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I Must now borrow a word or twaine with the Gentleman which
writ the first Verses in the beginning of this Pamphlet, and stleth
himselfe a friend to the Inventer of the Logarithmes projected in cretes.
Sir I see you are not disfavoured of the *Muses* and *Apollo*: your
verse is good, and the conceit well continued throughout: worthy
of a better subject: or if you were pleased to play and shew your
skill in so poore an argument, you might have spared me, who never
offended you, and whom peradventure you know not so much as by
sight. Did you ever heare me

— deny it was found out by you?

Did I ever tell you — it was mine owne?
would I have professed and owned these and such slight toyes, I could
have done it long before your *Inventer* had any abilitie of invention
in this way. No I did nothing in publishing hereof: I onely gave
way and permission, and it was not I that did addicte it to my selfe:
but his knowne worthlesse that did abdicte it from him. Nei-
ther is your argument of any force:

But if it were not thine, how durst thou say,
Thou woudst augment the same another day?

Why, what can he not say? What dares he not say, that may con-
duce to his vain-glory? And is it consequent, because he said if the
line were decupled, therfore he first invented it? If you are as good
at the Mathemetics, as you are dexterous in making Meter; you
cannot be ignorant that the breaking of the Circles one into many
is no new invention; but is performed in the Circles of Proportion,
as they were set out: wherein the Canon of Sines is broken into
two circles, and the Canon of Tangents into four. and I hope by
the same reasoun I could have broken them, or (if you will so call it)
augmented or multiplied them, into as many circles as I had desired.
But where as you Poetically jest at me,

Tis ten to one this will be challeng'd too,

I thinkke you will prove your selfe to be a truer *vates* then you were
aware of: though not by me (who have not esteemed such *minutiae*
worthy of me) but by *Thomas Browne* the Ioyner, whose indeed it
is, and not your supposed *Inventers*. Sir you will be pleased to ac-
cept some reason in plain prose for your verse: and understand I doe
you a favour to acknowledge you so farre.

And thus most honourable and noble Gentlemen having (as I
hope even in your judgements also) vindicated my truth and honestie
from such base petti-larcionary, as to steale his labours, and pilfer the
wares of so poore a pack; and cleared my credite from the scurrilous
and unmannery *calumniations & slanders*, which he hath so unjustly
endeav-

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endeavoured to fasten upon me: it will be high time to easse and free your patience from the trouble of such idle altercations. And I humbly beseech you, that if any where I seeme to take his injuries nearer to heart then in wisedome I should doe from so contemptible an adversary; not to impute it to passion: but curteously to consider the unufferablenesse of his most unworthy calumniations, and evill usage of me. It may peradventure be expected that I should also reade him a lecture of good manners: But I will not take any more paines in tutoring so ungracious a scholler. Only I will him to study over his own instruction. Yet this good advertisement I will receive from him, *that I have worke enough at home: and that my calling inviteth me to spend my houres better*, then any more to trouble my selfe with answering him according to his folly.

Dixi.

WILLIAM OUGHTRED.

51st Scarce

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